WHAT IS CLAIMED IS:

1. An exhaust pipe structure comprising:

an exhaust passage for exhaust gas discharged from a vehicle-installed engine that is provided below a floor of a vehicle; and

at least one muffler provided on an intermediate portion of the exhaust passage,

wherein the at least one muffler includes a main muffler having the greatest muffler capacity among the at least one muffler, and

wherein the main muffler has an external cylinder forming an outer shell portion of the main muffler, and

wherein the external cylinder has a circular sectional shape having a diameter of 100 mm to 150 mm, or a sectional shape that is substantially equal to an area of the circular sectional shape, and the external cylinder has a length of 800 mm to 1200 mm.

2. The exhaust pipe structure according to claim 1, wherein the only one main muffler is disposed in the exhaust passage as the at least one muffler.

3. The exhaust pipe structure according to claim 1, wherein as the at least one muffler, a subsidiary muffler having a smaller muffler capacity than the main muffler is disposed on the exhaust passage downstream of the main muffler.

4. The exhaust pipe structure according to claim 1, wherein a tunnel portion that extends in a longitudinal direction relative to the vehicle is provided in the floor between a front wheel and a rear wheel, and the main muffler is disposed in the tunnel portion.

5. The exhaust pipe structure according to claim 4, wherein the main muffler is disposed in the tunnel portion so that a front end portion of the main muffler is located in a forward portion of the tunnel portion.

6. The exhaust pipe structure according to claim 4, further comprising a catalytic converter disposed in a forward portion of the tunnel portion for controlling emissions,

wherein the main muffler is disposed in the tunnel portion so that a front end portion of the main muffler is located immediately rearward of the catalytic converter.

7. The exhaust pipe structure according to claim 4, wherein a reinforcement member is provided along an axial direction of the tunnel portion, on a lower surface of the floor near a side of the tunnel portion.

8. The exhaust pipe structure according to claim 4, wherein a fuel tank is disposed rearward of the tunnel portion of the floor, and a first cross member forming a portion of a frame of the vehicle and extending in a transverse direction relative to the vehicle is disposed between the main muffler and the fuel tank.

9. The exhaust pipe structure according to claim 8, wherein the main muffler is disposed so that at least a portion of a rear end portion of the main muffler is at the same height as the first cross member.

10. The exhaust pipe structure according to claim 8, further comprising:

a downstream-side exhaust pipe located downstream of the main muffler; and

a joint connecting the main muffler and the downstream-side exhaust pipe,

wherein the first cross member is disposed between the fuel tank and the joint, and is disposed so that at least a portion of the first cross member is at the same height as the joint.

11. The exhaust pipe structure according to claim 1, further comprising a separator dividing an internal space of the external cylinder in a direction of length,

wherein a portion of a frame of the vehicle is formed by a second cross member that extends in a transverse direction relative to the vehicle and extends across the main muffler, and the separator is located on or near an axis of the second cross member.

12. The exhaust pipe structure according to claim 1, further comprising:

a downstream-side exhaust pipe located downstream of the main muffler; and

a joint connecting the main muffler and the downstream-side exhaust pipe,

wherein a first cross member that forms a portion of a frame of the vehicle and that extends in a transverse direction relative to the vehicle is disposed at a site between the main muffler and the joint.

13. The exhaust pipe structure according to claim 12, wherein the joint is formed by a vibration absorption mechanism that is provided between the main muffler and the downstream-side exhaust pipe and that absorbs a vibration transmitted between the main muffler and the downstream-side exhaust pipe, by deformation of the joint.

14. The exhaust pipe structure according to claim 13,

wherein the vibration absorption mechanism comprises a seal ring provided on one of a rear end portion of the main muffler and the downstream-side exhaust pipe, and a seal seat that is provided on another one of the rear end portion of the main muffler and the downstream-side exhaust pipe, and that has a spherical concave surface that slidably contacts the seal ring, and

wherein the main muffler and the downstream-side exhaust pipe are disposed so that a center axis of the main muffler and a center axis of the downstream-side exhaust pipe intersect with each other.

15. The exhaust pipe structure according to claim 12, wherein the main muffler is disposed so that at least a portion of a rear end portion of the main muffler is at the same height as the first cross member.

16. The exhaust pipe structure according to claim 15, further comprising:

a downstream-side exhaust pipe located downstream of the main muffler; and

a joint connecting the main muffler and the downstream-side exhaust pipe,

wherein the a fuel tank is disposed rearward of the tunnel portion of the floor, and wherein the first cross member is located between the fuel tank and the joint, and is disposed so that at least a portion of the first cross member is at the same height as the joint.

17. The exhaust pipe structure according to claim 16, wherein the joint is formed by a vibration absorption mechanism that is provided between the main muffler and the downstream-side exhaust pipe and that absorbs a vibration transmitted between the main muffler and the downstream-side exhaust pipe, by deformation of the joint.

18. The exhaust pipe structure according to claim 17,

wherein the vibration absorption mechanism comprises a seal ring provided on one of a rear end portion of the main muffler and the downstream-side exhaust pipe, and a seal seat that is provided on another one of the rear end portion of the main muffler and the downstream-side exhaust pipe, and that has a spherical concave surface that slidably contacts the seal ring, and

wherein the main muffler and the downstream-side exhaust pipe are disposed so that a center axis of the main muffler and a center axis of the downstream-side exhaust pipe intersect with each other.

19. The exhaust pipe structure according to claim 1, wherein the main muffler is formed by an expansion muffler.

20. The exhaust pipe structure according to claim 19, further comprising a separator that is formed by a hollow annular body and that is provided along an inner wall surface of the external cylinder,

wherein an upstream-side wall surface of the separator is inclined so that further downstream portions of the upstream-side wall surface are closer to a center of the external cylinder.

21. The exhaust pipe structure according to claim 20, wherein a sensor is attached to the separator, with a detection portion of the sensor being protruded in a center hole portion of the separator.

22. The exhaust pipe structure according to claim 20, further comprising a bracket provided on an outside of a portion of the external cylinder corresponding to the separator so as to elastically support the external cylinder from the floor of the vehicle via a connector member having elasticity.

23. The exhaust pipe structure according to claim 19, wherein inside the external cylinder, a separator formed by a hollow annular body is provided along an inner wall surface of the external cylinder, and an upstream-side wall surface of the separator is inclined so that further downstream portions of the upstream-side wall surface are closer to a center of the external cylinder.

24. The exhaust pipe structure according to claim 23, wherein a sensor is attached to the separator, with a detection portion of the sensor being protruded in a center hole portion of the separator.

25. The exhaust pipe structure according to claim 23, further comprising a bracket provided on an outside of a portion of the external cylinder corresponding to the separator so as to elastically support the external cylinder from the floor of the vehicle via a connector member having elasticity.

26. The exhaust pipe structure according to claim 1, further comprising a catalytic converter disposed in a forward portion of the tunnel portion for controlling emissions,

wherein the catalytic converter is provided integrally with the main muffler not via an exhaust pipe.

27. The exhaust pipe structure according to claim 26, further comprising an accommodation chamber that is formed in a front end portion of the main muffler and that contains the catalytic converter.

28. The exhaust pipe structure according to claim 27, wherein the main muffler comprises:

an inlet-side exhaust conduit which is disposed within the external cylinder and whose upstream end is communicatively connected to the accommodation chamber and whose downstream end is open and located in a rearward portion of the external cylinder; and

an outlet-side exhaust conduit whose upstream end is open and located in the external cylinder near the accommodation chamber, and whose downstream end is connected to the rearward portion of the external cylinder.

29. The exhaust pipe structure according to claim 27, wherein the main muffler comprises an exhaust conduit whose upstream end is communicatively connected to the accommodation chamber and whose downstream end is open and located in the external cylinder near the accommodation chamber.

30. The exhaust pipe structure according to claim 26, wherein inside the external cylinder, a separator formed by a hollow annular body is provided along an inner wall surface of the external cylinder, and an upstream-side wall surface of the separator is inclined so that further downstream portions of the upstream-side wall surface are closer to a center of the external cylinder.

31. The exhaust pipe structure according to claim 30, wherein a sensor is attached to the separator, with a detection portion of the sensor being protruded in a center hole portion of the separator.

32. The exhaust pipe structure according to claim 30, further comprising a bracket provided on an outside of a portion of the external cylinder corresponding to the separator so as to elastically support the external cylinder from the floor of the vehicle via a connector member having elasticity.

33. An exhaust pipe structure comprising:

an exhaust passage for exhaust gas discharged from a vehicle-installed engine that is provided below a floor of a vehicle; and

at least one muffler provided on an intermediate portion of the exhaust passage, wherein the at least one muffler includes a main muffler having the greatest muffler capacity among the at least one muffler, and

wherein the main muffler has an external cylinder forming an outer shell portion of the main muffler, and

wherein the external cylinder has a sectional area perpendicular to a direction of an axis of the external cylinder which is in a range of $2500\pi\ \mathrm{mm}^2$ to $5625\pi\ \mathrm{mm}^2$, and the external cylinder has a length in a range of 800 mm to 12000 mm.